

A NEW ENCYRTID GENUS PARASITIC ON BUG EGGS.

By E. F. RIEK, Division of Entomology, C.S.I.R.O., Canberra, A.C.T.

(Nine Text-figures.)

[Read 27th June, 1962.]

Synopsis.

A new genus of bug egg-parasites, containing species of possible economic importance, is described as *Xenoencyrtus*, with genotype *X. niger*, sp. nov.

A number of genera of the chalcidoid family Encyrtidae are known to parasitize bug eggs. A species has recently been reared from eggs of the pentatomid bug, *Nezara viridula smaragdula* (F.), an introduced pest of some economic importance. This parasite species is being cultured for possible future distribution in efforts to control the bug. A second undescribed species of the same genus, bred from the same host, is known from preserved material.

Another two species of this genus have been described from bug eggs. Girault (1915: 172) described under the genus *Ericydnus*, one species, *hemipterus*, bred from pentatomid eggs. Dodd (1917: 354) described two species, and a variety, under *Tetracnemella* and transferred *hemipterus* to that genus. At least one of Dodd's two species is congeneric with *hemipterus* which, however, differs from *Tetracnemella* quite markedly in wing venation, though it does have the broad truncate cutting edge to the mandible and the widely separated axillae that occur in the genotype species of *Tetracnemella*.

This new genus, represented by at least four species, is very similar to *Ooencyrtus* in most respects, but differs in mandible shape as well as in wing venation and structure of the axillae.

Genus XENOENCYRTUS, gen. nov.

Genotype, Xenoencyrtus niger, sp. nov.

Very similar to *Ooencyrtus*, but mandible with a broad straight cutting edge developed from the upper two teeth; marginal vein thickened, distinctly longer than wide, slightly longer than stigmal vein, post-marginal vein only slightly developed, very much shorter than stigmal; basal funicle segments almost as long as pedicel; ocelli minute; axillae very widely separated.

In most, if not all, species of the genus there is a brachypterous as well as a fully-winged form. The brachypterous condition occurs in both sexes. In all known species the fully developed forewing has a broad infuscated band across the middle of the wing. In brachypterous specimens the apical third of the wing is infuscated. The thickened marginal vein is evident in the brachypterous as well as in the fully winged condition.

*Key to species of Xenoencyrtus.**Winged forms:*

1. Middle legs, except coxae, all pale; head, thorax and base of gaster dark metallic green *megymeni* (Dodd).
Middle leg mostly dark but tarsus and apex of tibia pale.
 - i. Head, thorax and base of gaster dark metallic green; lateral thorax and gaster metallic purple black; middle leg pale only at tarsus and apex of tibia *niger*, sp. nov.
 - ii. Head, thorax and base of gaster metallic blue; otherwise gaster metallic purple black; lateral thorax mostly dull reddish; middle leg pale at joints and with tibia mostly pale *rubricatus*, sp. nov.

Brachypterous forms:

1. Head, thorax and base of gaster metallic purple blue, gaster purple black; lateral thorax with dull reddish hues; lower face more glabrous than vertex *rubricatus*, sp. nov.
Head, thorax and base of gaster metallic green, scutellum particularly green, head more blue, gaster shining black, lateral thorax shining black with some purple hues; lower face lined, more ornamented than vertex *niger*, sp. nov.
"Brilliant metallic dark green, the mesopleurum and abdomen purple" . . . *hemipterus* (Grlt).

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In most, if not all, species of the genus there is a brachypterous as well as a fully-winged form. The brachypterous condition occurs in both sexes. In all known species the fully developed forewing has a broad infuscated band across the middle of the wing. In brachypterous specimens the apical third of the wing is infuscated. The thickened marginal vein is evident in the brachypterous as well as in the fully winged condition.

*Key to species of Xenoencyrtus.**Winged forms:*

1. Middle legs, except coxae, all pale; head, thorax and base of gaster dark metallic green *megymeni* (Dodd).
Middle leg mostly dark but tarsus and apex of tibia pale.
 - i. Head, thorax and base of gaster dark metallic green; lateral thorax and gaster metallic purple black; middle leg pale only at tarsus and apex of tibia *niger*, sp. nov.
 - ii. Head, thorax and base of gaster metallic blue; otherwise gaster metallic purple black; lateral thorax mostly dull reddish; middle leg pale at joints and with tibia mostly pale *rubricatus*, sp. nov.

Brachypterous forms:

1. Head, thorax and base of gaster metallic purple blue, gaster purple black; lateral thorax with dull reddish hues; lower face more glabrous than vertex *rubricatus*, sp. nov.
Head, thorax and base of gaster metallic green, scutellum particularly green, head more blue, gaster shining black, lateral thorax shining black with some purple hues; lower face lined, more ornamented than vertex *niger*, sp. nov.
"Brilliant metallic dark green, the mesopleurum and abdomen purple" . . . *hemipterus* (Grlt).

XENOENCYRTUS HEMIPTERUS (Girault).

Ericydnus hemipterus Girault, 1915: 172.—*Tetracnemella hemiptera* (Girault) Dodd, 1917: 355.

Only the brachypterous form has been described.

Types: In the Queensland Museum.

Type locality: Gordonvale, Queensland.

The species was reared from pentatomid eggs.

XENOENCYRTUS MEGYMEI (Dodd).

Tetracnemella megymeni Dodd, 1917: 354.—*Tetracnemella megymeni brachyptera* Dodd, 1917: 355.

The fully winged female and the brachypterous male and female have been described.

Types: In the South Australian Museum.

Type locality: Darwin, Northern Territory.

The species was bred from the eggs of the hemipteron, *Megymenum insulare* Wwd. (Pentatomidae).

XENOENCYRTUS NIGER, sp. nov. (Figs 1-8).

Female, fully winged. Head, thorax and base of gaster dark metallic green, remainder of gaster and lateral thorax metallic purple black; antenna all dark; mandibles dark; tegula dark; legs mostly metallic black, tarsi pale and apex of middle tibia narrowly pale; forewing with a transverse infuscated band towards the middle of the wing, from the bend of the submarginal vein to the apex of the stigmal vein, the band widening slightly posteriorly, the distal margin straight, oblique.

Length 1.2 to 1.3 mm.; vertex of head wide, but not quite as wide as eye width, mesal margin of eyes converging slightly to apex, vertex very finely ornamented, scaly; ocelli very small, lateral ocelli about their own diameter distant from eye, distinctly further apart than either is from median ocellus, median ocellus a little further from eye than from lateral ocellus; caudal margin of vertex concave, subcarinate; frons, in lateral view, regularly convex; scrobes clearly defined, short, deep, converging above and meeting almost in a point, very widely separated from eye margin, area between them somewhat raised but flattening to clypeal region; antennal insertions well separated, but only slightly further apart than either is from eye, distinctly closer to lower margin of clypeus than to eye; lower face and gena irregularly finely rugose, the rugae more or less vertical; gena long, twice as long as distance from antennal insertion to lower border of clypeus; lower face with only a few scattered hairs, with a single row bordering the mesal margin of the eye; scape long and thin, pedicel long, more than twice as long as wide, funicle segments thinner than pedicel, all considerably longer than wide, first funicle about two-thirds as long as pedicel, first five funicles all subequal in length, widening very slightly, sixth funicle slightly shorter than fifth; club long, only slightly expanded, clearly three-segmented, the first segment slightly the longest, apex unevenly, rather pointedly rounded; club clearly somewhat less than half as long as funicle; scutellum glabrous at apex, slightly scaly at base, hairs widely absent from meson, apical pair enlarged, erect, the others shorter and widely spaced; gaster about as long as thorax, the caudal margins of the tergites strongly convex, the apical tergite very much the largest, ovipositor valves only just visible; middle tarsus thickened, basitarsus long, about as long as the following three tarsal segments combined, apical tarsal segment clearly longer than the fourth, tarsus tapering to the apical segments which are quite narrow, basitarsal pad formed by a single row of short, spaced, rather acute tubercles on each lateral margin, the following tarsal segments with similarly placed tubercles usually three on the second segment, two on the third segment and one on the fourth segment; forewing with irregular costal margin, emarginate at the bend of the submarginal vein, costal margin convex near base producing a wide costal cell which then narrows rapidly to become linear in the region of the bend in the submarginal vein, submarginal vein somewhat thickened from the

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Only the brachypterous form has been described.

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The species was reared from pentatomid eggs.

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The fully winged female and the brachypterous male and female have been described.

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Type locality: Darwin, Northern Territory.

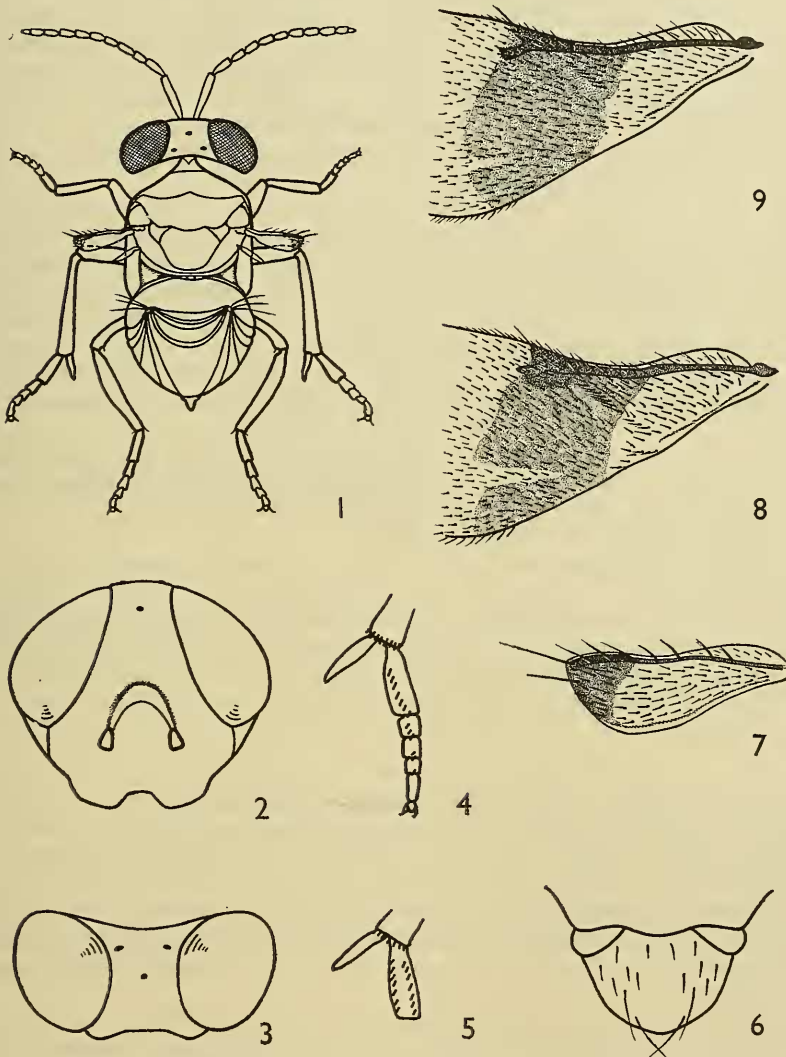
The species was bred from the eggs of the hemipteron, *Megymenum insulare* Wwd. (Pentatomidae).

XENOENCYRTUS NIGER, sp. nov. (Figs 1-8).

Female, fully winged. Head, thorax and base of gaster dark metallic green, remainder of gaster and lateral thorax metallic purply black; antenna all dark; mandibles dark; tegula dark; legs mostly metallic black, tarsi pale and apex of middle tibia narrowly pale; forewing with a transverse infuscated band towards the middle of the wing, from the bend of the submarginal vein to the apex of the stigmal vein, the band widening slightly posteriorly, the distal margin straight, oblique.

Length 1.2 to 1.3 mm.; vertex of head wide, but not quite as wide as eye width, mesal margin of eyes converging slightly to apex, vertex very finely ornamented, scaly; ocelli very small, lateral ocelli about their own diameter distant from eye, distinctly further apart than either is from median ocellus, median ocellus a little further from eye than from lateral ocellus; caudal margin of vertex concave, subcarinate; frons, in lateral view, regularly convex; scrobes clearly defined, short, deep, converging above and meeting almost in a point, very widely separated from eye margin, area between them somewhat raised but flattening to clypeal region; antennal insertions well separated, but only slightly further apart than either is from eye, distinctly closer to lower margin of clypeus than to eye; lower face and gena irregularly finely rugose, the rugae more or less vertical; gena long, twice as long as distance from antennal insertion to lower border of clypeus; lower face with only a few scattered hairs, with a single row bordering the mesal margin of the eye; scape long and thin, pedicel long, more than twice as long as wide, funicle segments thinner than pedicel, all considerably longer than wide, first funicle about two-thirds as long as pedicel, first five funicles all subequal in length, widening very slightly, sixth funicle slightly shorter than fifth; club long, only slightly expanded, clearly three-segmented, the first segment slightly the longest, apex unevenly, rather pointedly rounded; club clearly somewhat less than half as long as funicle; scutellum glabrous at apex, slightly scaly at base, hairs widely absent from meson, apical pair enlarged, erect, the others shorter and widely spaced; gaster about as long as thorax, the caudal margins of the tergites strongly convex, the apical tergite very much the largest, ovipositor valves only just visible; middle tarsus thickened, basitarsus long, about as long as the following three tarsal segments combined, apical tarsal segment clearly longer than the fourth, tarsus tapering to the apical segments which are quite narrow, basitarsal pad formed by a single row of short, spaced, rather acute tubercles on each lateral margin, the following tarsal segments with similarly placed tubercles usually three on the second segment, two on the third segment and one on the fourth segment; forewing with irregular costal margin, emarginate at the bend of the submarginal vein, costal margin convex near base producing a wide costal cell which then narrows rapidly to become linear in the region of the bend in the submarginal vein, submarginal vein somewhat thickened from the

bend to the marginal vein, marginal vein thickened but distinctly longer than wide, stigmal vein short, with an upper spur, distinctly shorter than the marginal vein, post-marginal short, only about half as long as the stigmal; area below submarginal vein with evenly spaced setae almost to base.

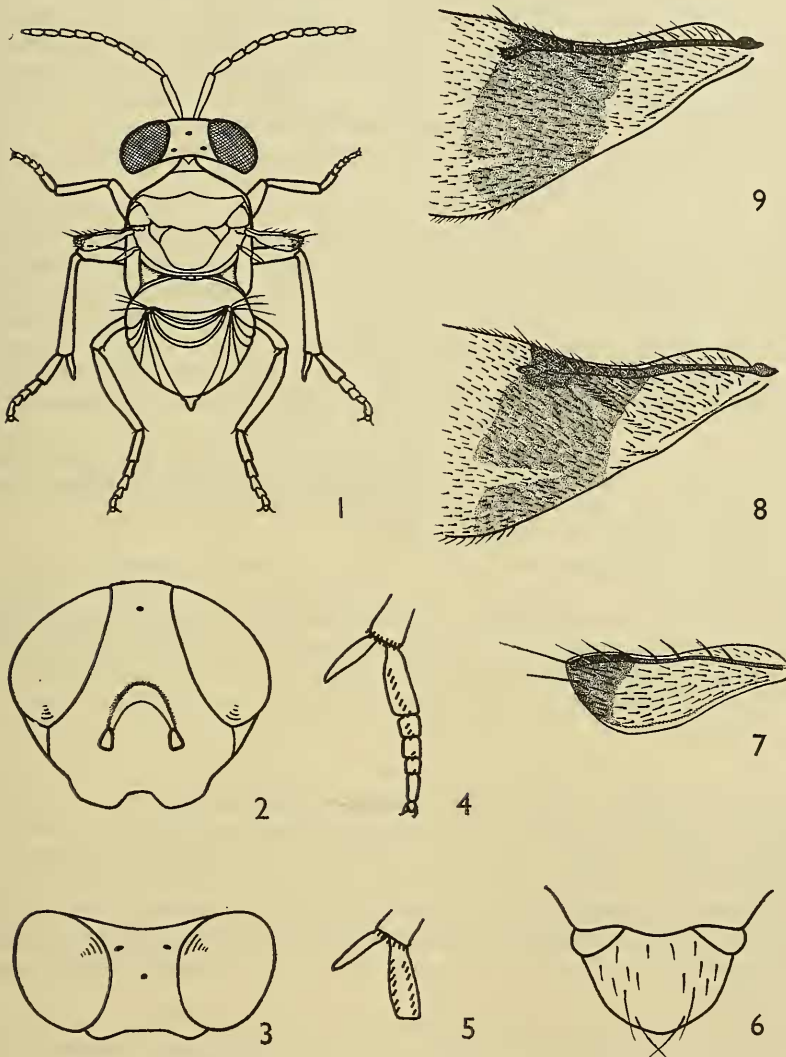


Figs 1-8. *Xenoencyrtus niger*, gen. et sp. nov. 1, Brachypterous female, $\times 40$; 2, Head of winged female, front view, $\times 70$; 3, Head of winged female, dorsal view, $\times 70$; 4, Middle tarsus, ventro-lateral view, $\times 70$; 5, Middle basitarsus, ventral view, $\times 70$; 6, Scutellum and axillae, $\times 70$; 7, Forewing, brachypterous form, $\times 100$; 8, Basal half of forewing, fully winged form, $\times 70$.

Fig. 9. *Xenoencyrtus rubricatus*, sp. nov. Basal half of forewing, fully winged form, $\times 70$.

Female, brachypterous. Very similar to the fully winged female except for the wings and the colour of the middle legs. Forewings appearing white except for an apical dark triangle covering the apical quarter or so of the wing; apex of wing rather obliquely truncate, venation reaching to apex, the thickened marginal vein distinct but postmarginal and stigmal veins not distinguishable, apical bristle on marginal vein enlarged, almost twice as long as the preceding bristles; hind wing thread-like, only

bend to the marginal vein, marginal vein thickened but distinctly longer than wide, stigmal vein short, with an upper spur, distinctly shorter than the marginal vein, post-marginal short, only about half as long as the stigmal; area below submarginal vein with evenly spaced setae almost to base.



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Fig. 9. *Xenoencyrtus rubricatus*, sp. nov. Basal half of forewing, fully winged form, $\times 70$.

Female, brachypterous. Very similar to the fully winged female except for the wings and the colour of the middle legs. Forewings appearing white except for an apical dark triangle covering the apical quarter or so of the wing; apex of wing rather obliquely truncate, venation reaching to apex, the thickened marginal vein distinct but postmarginal and stigmal veins not distinguishable, apical bristle on marginal vein enlarged, almost twice as long as the preceding bristles; hind wing thread-like, only

about half as long as the forewing; middle tibia mostly pale, only slightly darkened towards base.

Male, fully winged. Body colouring similar to female; legs similar, but middle tibia mostly pale; forewing infuscated but less intense than in female.

Length 0.9 mm.; vertex a little wider than in female; antenna with the funicle segments clothed in long hairs, hairs distinctly longer than the width of the segments, first funicle distinctly longer than pedicel, funicle segments all subequal though decreasing slightly to the sixth segment, club only slightly expanded, a little more than twice as long as sixth funicle.

Very similar to the brachypterous male apart from the wings.

Male, brachypterous. Colouring as in brachypterous female with middle tibia mostly pale and wings darkened at apex.

Length 0.9 to 1.0 mm.; vertex slightly wider than eye width, lateral ocelli clearly more than their own diameter distant from eye, median ocellus distinctly further from eye than from lateral ocellus; scape long and thin, very slightly flattened, pedicel almost twice as long as wide, funicle segments very long, as wide as pedicel, clothed in long hairs distinctly longer than width of segments, first funicle distinctly longer than pedicel, second funicle subequal to first, succeeding funicle segments decreasing very slightly, but sixth funicle distinctly more than twice as long as wide, club large, only slightly expanded, more than twice as long as sixth funicle, apex tapering, asymmetrically rounded.

Types: Holotype ♀, allotype brachypterous ♂, typical brachypterous ♀ and typical ♂ and paratypes in the C.S.I.R.O., Division of Entomology Museum, Canberra. Paratypes in the British Museum (Nat. Hist.) and the U.S. National Museum.

Type locality: Canberra, Australia.

Host: Bred in insectary from eggs of *Nezara viridula smaragdula* (F.) (13 Oct. 1961, G. R. Wearne).

The type series has been reared from one field-collected brachypterous female.

The brachypterous form is very similar to *hemipterus*, but differs in the colour of the abdomen and of the lateral thorax. The male is normally brachypterous. Only one fully winged male has been observed. Brachypterous, as well as fully winged, females are common.

XENOENCYRTUS RUBRICATUS, sp. nov. (Fig. 9).

Female, fully winged. Head, thorax and base of gaster dark metallic blue, otherwise gaster metallic purplish black; lateral thorax mostly dull reddish; antenna mostly dark, but club and apical funicle segments somewhat paler; mandibles dark; tegula dark; legs mostly metallic black, but tarsi, joints and most of middle tibia pale; forewing with a transverse infuscated band towards the middle of the wing, from the bend of the submarginal vein to the apex of the stigmal vein, the distal margin of the infuscation decidedly convex in the middle, without a narrow deep re-entrant angle towards the posterior border.

Length 1.0 to 1.1 mm.; vertex of head wide but distinctly less than eye width, mesal margin of eyes clearly converging to apex, vertex very finely ornamented, scaly; ocelli very small, lateral ocelli clearly somewhat more than their own diameter distant from eye, distinctly further apart than either is from median ocellus, median ocellus only about as far from eye as from lateral ocellus; caudal margin of vertex concave, subcarinate; frons, in lateral view, regularly convex; scrobes clearly defined, short, deep, converging above and meeting in a rounded point, very widely separated from eye margin, their margins rounded, area between them somewhat raised but flattening to clypeal region; antennal insertions well separated, but only about as far apart as each is from eye, distinctly closer to lower margin of clypeus than to eye; lower face and gena irregularly finely rugose, the rugae more or less vertical but shallow and widely spaced; gena long, twice as long as distance from antennal insertion to lower border of clypeus; lower face with only a few scattered hairs, with a single row bordering the mesal margin of the eye; scape long and thin, pedicel long, more than

about half as long as the forewing; middle tibia mostly pale, only slightly darkened towards base.

Male, fully winged. Body colouring similar to female; legs similar, but middle tibia mostly pale; forewing infuscated but less intense than in female.

Length 0.9 mm.; vertex a little wider than in female; antenna with the funicle segments clothed in long hairs, hairs distinctly longer than the width of the segments, first funicle distinctly longer than pedicel, funicle segments all subequal though decreasing slightly to the sixth segment, club only slightly expanded, a little more than twice as long as sixth funicle.

Very similar to the brachypterous male apart from the wings.

Male, brachypterous. Colouring as in brachypterous female with middle tibia mostly pale and wings darkened at apex.

Length 0.9 to 1.0 mm.; vertex slightly wider than eye width, lateral ocelli clearly more than their own diameter distant from eye, median ocellus distinctly further from eye than from lateral ocellus; scape long and thin, very slightly flattened, pedicel almost twice as long as wide, funicle segments very long, as wide as pedicel, clothed in long hairs distinctly longer than width of segments, first funicle distinctly longer than pedicel, second funicle subequal to first, succeeding funicle segments decreasing very slightly, but sixth funicle distinctly more than twice as long as wide, club large, only slightly expanded, more than twice as long as sixth funicle, apex tapering, asymmetrically rounded.

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Female, brachypterous. Very similar to the fully winged female except for the wings. There is little if any difference in the colour of the legs. Wings very similar to those of *niger*, but the apex of the forewing a little more rounded.

Males. Not known.

Types: Holotype ♀, typical brachypterous ♀ and paratype females in the C.S.I.R.O. Division of Entomology Museum, Canberra. The holotype is the outermost specimen of a card mounted series of nine specimens. Paratype fully winged ♀ and paratype brachypterous ♀ in the British Museum (Nat. Hist.).

Type locality: Toowoomba, Queensland (4 Feb. 1938, H. Jarvis).

Host: Bred from eggs of *Nezara viridula*.

References.

- DODD, A. P., 1917.—Records and descriptions of Australian Chalcidoidea. *Trans. Roy. Soc. S. Austr.*, 41: 354.
- GIRAULT, A. A., 1915.—Australian Hymenoptera, Chalcidoidea Part 7, Encyrtidae. *Mem Queensl. Mus.*, 4: 1-184.

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